





# Smart Linkage to Care (Smart LtC) App

Michelle Moorhouse 01 June 2016

# Background

- Research shows smartphone applications (apps)
  improve adherence through engagement
  - Perera et al. (New Zealand, 2014) found decreased viral load at 3 months (p=0.023) in patients (n=28)
- High smartphone use in SA
  - Ownership = 35-50% smartphone
  - New sales = 85% smartphone
  - Observation of high smartphone (70-80%) use in Hillbrow CHC







# **Vision and Policy Implications**

A vision of an "AIDS-free Johannesburg"

- All patients would have immediate access to their lab results through smartphone
- All HIV clinicians with direct access to lab results for case management
- Patient better linked to health services and receiving personalised information – client-centered









# Hypothesis

 "Providing smartphone-owning patients their laboratory results immediately and securely from the moment of HIV diagnosis, with linked explanatory information about what the results mean, along with prompts to link and re-link with care, will lead to improved linkage to care, better retention in care, higher patient satisfaction, better knowledge of CD4 and viral load results, improved healthcare worker requests for results, decreased additional blood tests, clinic decongestion, and higher rates of viral suppression."

# **Study Overview**

#### Method

- Multicentre RCT in five medium-to-large HCT/ART sites in Johannesburg on 2 000 newly diagnosed HIV clients
  - 50% male and under 25
  - Smartphone app vs. standard of care

### Primary outcome

Linkage to care (defined as attending for a CD4 count measurement PLUS one other NHLS test within 6 months of HIV diagnosis)







# Smart LtC App: Key Features

- Password-protected (username, password and PIN)
  - Lab results, health information and appointment reminders
  - HIV, TB, STI, healthy living information content and links
- English and isiZulu
- Consuming minimal network data
- Non-descript app icon and name
- For lab results → Simple notification
- Call-back number for technical problems
- Automated prompts if client not noted to have entered care
- App usage monitored, including during clinic visits
- Notification by client in case of self-transfer





### Recruitment Methods

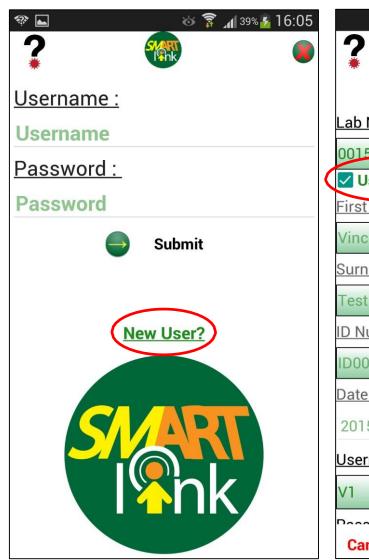
- Facility-based fieldworkers using tablet devices for data collection
- Potential patients identified through facility staff
- Pre-screening conducted by fieldworker
  - Demographics
- After confirmation HIV test and CD4 count blood taken, additional screening conducted
  - Phone type, Android version
- If eligible, recruitment:
  - Informed consent
  - HIV knowledge quiz
  - Randomisation; app installed if intervention arm
    - App installed through a Wi-Fi router

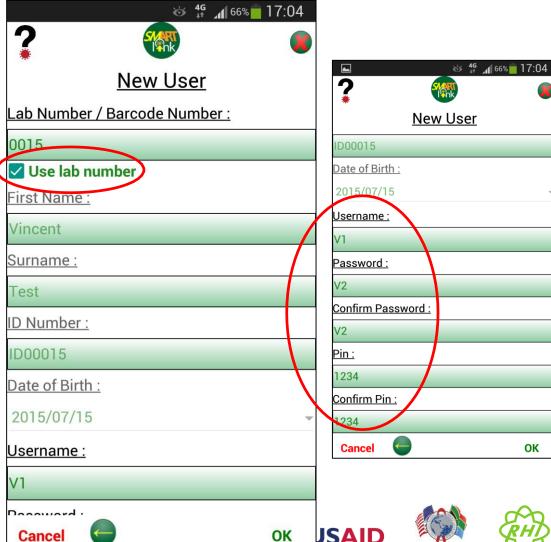






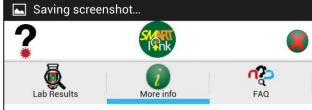
# Registration and Log-in





## CD4 and Viral Load Results





#### CD4 count of 500 or lower

You should start antiretrovirals (ARVs) when you have a CD4 count of 500 or below, even if you are feeling well. ARVs will help to keep you healthy. Go back to your clinic and speak to your nurse or doctor so they can start you on ARV medication.



#### Viral Load (VL) higher than 1 000

This is a sign that your treatment is not controlling the HIV virus in your blood. The most common reason for the treatment not working is if the ARVs are not taken correctly. Inform your nurse, doctor or counsellor about your high viral load result. Your doctor will then decide if you need more blood tests or different ARVs. Sometimes the virus develops resistance, which means the virus continues to multiply despite you taking your ARVs correctly. The higher the viral load, the more the virus will destroy your soldier cells (CD4 cells) and you will be more likely to become ill.

To prevent the virus becoming resistant to your ARVs, you need to take your medication <u>every day and at the same time</u>.

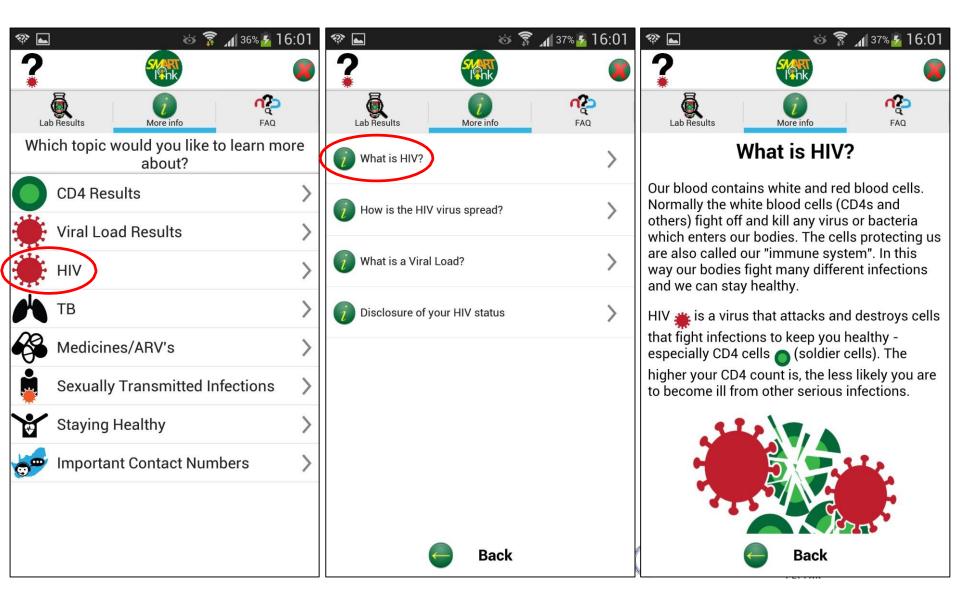


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## Content



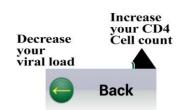
### **More Content**

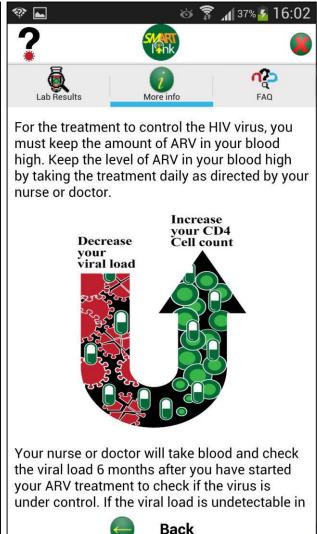


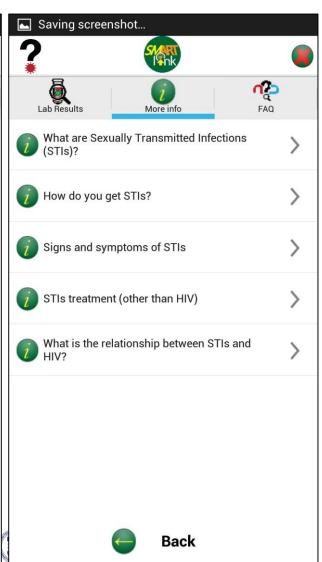
#### What is a Viral Load?

Viral load is the amount of HIV viruses in the blood. This is measured vy a blood test in a laboratory. The goal of taking your antiretrovirals (ARVs) is to reduce the amount of HIV virus in your blood. If there are so few viruses that the viral load test cannot measure it, it is known as undetectable viral load. Low level of HIV virus in the blood stops HIV from destroying your CD4 soldier cells. This does not mean that you are cured of the HIV virus. The virus remains in your body lifelong.

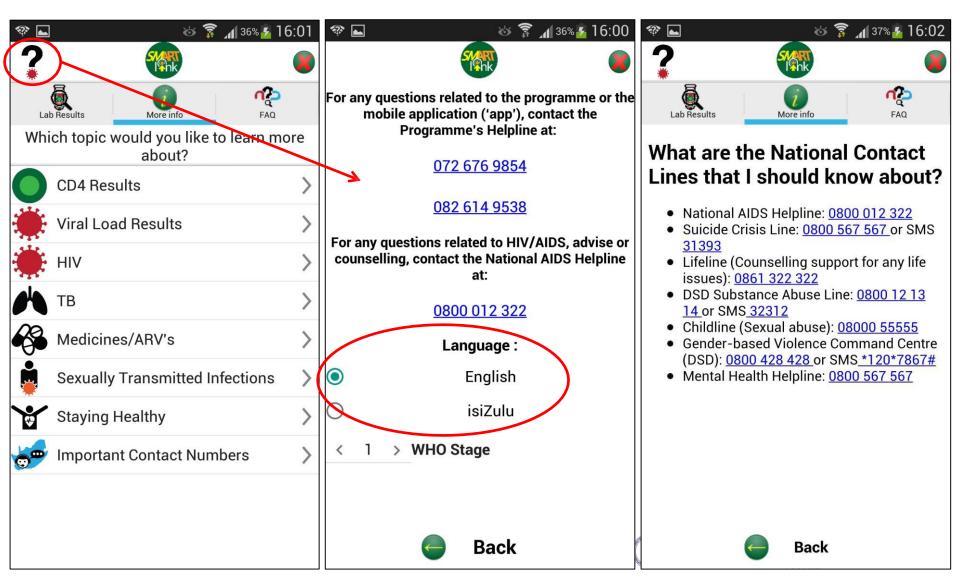
For the treatment to control the HIV virus, you must keep the amount of ARV in your blood high. Keep the level of ARV in your blood high by taking the treatment daily as directed by your nurse or doctor.



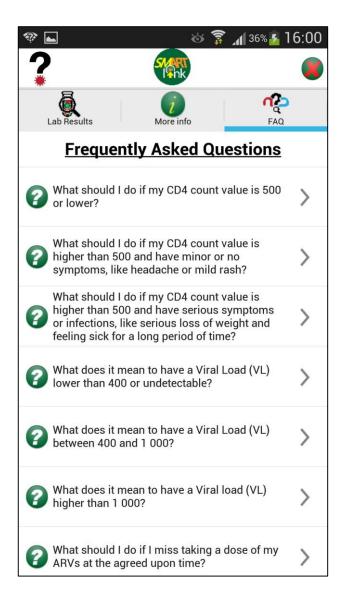


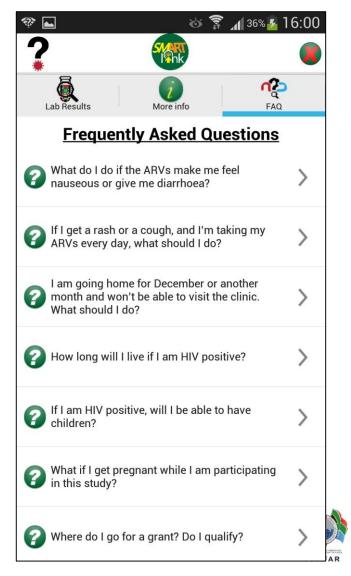


# **Programmatic and Social Services**



## **FAQs**







### **Current status**

- 4086 newly diagnosed HIV-positive patients screened
  - Pre-screened ineligibility:
    - Unwilling to participate/refuse: 96
    - Pregnant: 254
    - Cannot read EN or ZU: 213
    - No photo ID: 2134 (removed as requirement in month 3)
- 1389 eligible patients
  - No phone, not Android, wrong Android version: 1043
- 346 participants recruited







178 intervention 169 control

# Follow-up

- CD4/viral load sent to app when result ready
- 6 month appointment reminder
  - Notifications at 5.5 and 6 months
- NHLS lab data monitored for follow-up CD4 and/or viral load
- 12 month appointment reminder
  - Notifications at 11.5 and 12 months
- 12 month follow-up with participant
  - HIV knowledge quiz
  - WHO Quality of Life survey
  - ACDG Adherence survey
  - Satisfaction survey







## Challenges and Lessons Learned

- Fewer HIV-positive patients than expected (based on DHIS)
  - One quarter the patients in some facilities!
  - Outcome: Lowered recruitment target to 350
- Fewer young people than expected
  - Changed age groups to 18-30 and 31+
- Multiple sites
  - Logistics of research staff getting to sites efficiently with tablet devices
- Identifying positive patients
  - Patients not following through to blood rooms







# Challenges cont'd

- App developer challenges
  - Recommended by partner
    - Not experienced with smartphone apps
    - Resulted in:
      - Slow creation of app
      - Basic app development issues
      - Size of app (too large!)
      - Only works on limited devices
      - Account and sign-in errors







### Recommendations

- Find an app developer with significant app development experience
- Offer app on app store (Google Play, Apple App Store etc.)
  - No need for Wi-Fi router
- Fewer sites allows for efficiency
- Be weary of DHIS data







# Summary of key points

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- Fewer HIV-positive patients than expected (based on DHIS)
- Find an app developer with significant app development experience













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